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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/799,839	03/12/2004	Randy L. Hoffman	200316546-1	8519
22879 7590 01/09/2009 HEWLETT PACKARD COMPANY P O BOX 272400, 3404 E. HARMONY ROAD INTELLECTUAL PROPERTY ADMINISTRATION FORT COLLINS, CO 80527-2400				
EXAMINER NGUYEN, DINH P				
ART UNIT 2893		PAPER NUMBER		
NOTIFICATION DATE 01/09/2009		DELIVERY MODE ELECTRONIC		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary

Application No.

10/799,839

Applicant(s)

HOFFMAN ET AL.

Examiner

DILINH P. NGUYEN

Art Unit

2893

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 September 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-57 is/are pending in the application.
- 4a) Of the above claim(s) 2-5, 8, 9, 12, 13 and 16-57 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1 is/are rejected.
- 7) ☒ Claim(s) 6, 7, 10, 11, 14 and 15 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 10/13/08.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Terminal Disclaimer

1. The terminal disclaimer filed on 4/10/08 disclaiming the terminal portion of any patent granted on this application which would extend beyond the expiration date of Pat. No. 7,242,039 has been reviewed and is accepted. The terminal disclaimer has been recorded.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kawasaki et al. (U.S. Pat. 6727522) in view of Nishizawa (U.S. Pat. 4641167).

Kawasaki et al. disclose a semiconductor device (fig. 1A), comprising:

a drain electrode 13 (fig. 1A, column 3, line 17);

a source electrode 12 (fig. 1A, column 3, line 17);

a channel 11 contacting the drain electrode 13 and the source electrode 12,

wherein the channel 11 includes one or more of a metal oxide including zinc magnesium oxide $Mg_xZn_{1-x}O$, zinc cadmium oxide $Cd_xZn_{1-x}O$ (fig. 1A, column 3, lines 33-36); and

a gate dielectric 15 positioned between a gate electrode 14 and the channel 11 (fig. 1A, column 3, lines 16-18).

Kawasaki et al. do not disclose the channel including zinc-germanium.

However, Nishizawa discloses a semiconductor device (cover fig.) comprising: a channel (a region between source electrode 6 and drain electrode 8) contacting the drain electrode and the source electrode, wherein the channel including zinc-germanium [a channel is doped with an impurity atom, such as: gold, mercury, zinc or the like in a germanium substrate] (cover fig., column 3, lines 13-23).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have the channel including zinc-germanium as taught by Nishizawa into the device of Kawasaki et al. in order to provide a semiconductor device which is highly sensitive and operable at high speed in infrared to far infrared regions (Nishizawa, column 1, lines 20-23).

Allowable Subject Matter

Claims 6-7, 10-11 and 14-15 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

Applicant's arguments filed 9/30/08 have been fully considered but they are not persuasive.

Nishizawa does not teach, suggest or even mention a metal oxide used to form the channel. Doping a germanium substrate with zinc produces zinc molecules embedded in germanium. Doping a germanium substrate with zinc does not produce a

chemical reaction resulting in zinc-germanium or zinc-germanium oxide as recited as one of the options in claim 1.

Applicant's arguments have been fully considered but they are not persuasive because this argument has no immediate apparent relevance to the issues presented by the rejection before us since an applicant cannot show nonobviousness by attacking references individually wherein the rejection is based upon a combination of references. In re Young, 403 F. 2d 754, 757, 159 USPQ 725, 728 (CCPA 1968).

It should be noted that the rejection of claim 1 is not based on anticipation, but rather, are based on obviousness.

Examiner relies on the combined teachings at Kawasaki et al. and Nishizawa.

Nishizawa is not relied on for teaching the channel layer includes oxide. Nishizawa is relied on for teaching a semiconductor device (cover fig.) comprising: a channel (a region between source electrode 6 and drain electrode 8) contacting the drain electrode and the source electrode, wherein the channel including zinc-germanium [a channel is doped with an impurity atom, such as: gold, mercury, zinc or the like in a germanium substrate] (cover fig., column 3, lines 13-23). The Examiner thus regards the Applicant's assertions as constituting evidence that the Applicant has failed to consider as a whole the prior art teachings disclosed by the combining of the references.

The applicant argues that neither of the cited prior art references teach or suggest the claimed semiconductor device comprising a channel including an oxide

from the following list: "zinc-germanium, zinc-lead, cadmium-germanium, cadmium-tin or cadmium-lead."

In response, the examiner disagrees with applicant's argument because Kawasaki et al. disclose the channel 11 includes one or more of a metal oxide including zinc magnesium oxide $Mg_xZn_{1-x}O$, zinc cadmium oxide $Cd_xZn_{1-x}O$ (fig. 1A, column 3, lines 33-36). Kawasaki et al. do not disclose the channel including zinc-germanium.

However, Nishizawa discloses a semiconductor device (cover fig.) comprising: a channel (a region between source electrode 6 and drain electrode 8) contacting the drain electrode and the source electrode, wherein the channel including zinc-germanium [a channel is doped with an impurity atom, such as: gold, mercury, zinc or the like in a germanium substrate] (cover fig., column 3, lines 13-23).

As Nishizawa discloses, one of ordinary skill in the art would have been motivated to have the channel including zinc-germanium into the metal oxide channel of Kawasaki et al., in order to provide a semiconductor device which is highly sensitive and operable at high speed in infrared to far infrared regions (column 1, lines 20-23).

Thus, Kawasaki et al. in view of Nishizawa disclose all the limitations as required by claim 1. Therefore, the rejection is properly maintained.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DILINH P. NGUYEN whose telephone number is (571) 272-1712. The examiner can normally be reached on 9:00 AM - 6:30 PM (Monday-Thursday).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Davienne Monbleau can be reached on (571) 272-1945. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

DLN

1/5/09

/A. Sefer/
Primary Examiner
Art Unit 2893